



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,405	06/26/2003	Sabina J. Houle	884.848US1	8439
21186	7590	03/22/2005	EXAMINER	
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402			THOMPSON, GREGORY D	
			ART UNIT	PAPER NUMBER
			2835	

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/608,405

Applicant(s)

HOULE, SABINA J.

Examiner

Gregory D. Thompson

Art Unit

2835

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-7, 10-26 is/are allowed.
- 6) ☒ Claim(s) 1, 8 and 9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/29/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

1. Claims 1, 8-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, lines 6-7 indefinite/confusing rendering this part of the claim scope undeterminal. For example, not clear what happens to the surface features along the deforming interface with respect to the heat conducting structure and first metal containing layer once plastic deformation takes place.

Claims 8 and 9 indefinite/confusing rendering this part of the claim scope undeterminal. For example, not clear what is meant by the language of "heat placing" in line 1 of claims 8, 9. Also, language of "a heat conducting structure on a first metal containing layer" in lines 1-2 of claims 8, 9 not clear with the language of "a heat conducting structure on a first metal containing layer" in claim 1, line 1. Same structure and layer or different structure and layer?

2. Claim 22 is objected to because of the following informalities: line 2 language of "a processor" should be "the processor chip" for consistent language. Appropriate correction is required.

3. Claims 1 and 8-9 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

4. Claims 2-7, 10-26 are allowed.

5. The cited art does not teach nor suggest the method of manufacturing a thermal interface device wherein at least one of the attaching operations of the first metal containing layer includes plastic deformation of the first layer at a temperature lower

than a melting temperature of the first layer in lines 8-9 of claim 1. The plastic deformation below the melting temperature is a cold forming process that acts to raise the hardness and strength of the first layer and by maintaining below the melting temperature issues of wetting are avoided as discussed on pages 6-7 of the disclosure as claimed in claim 1.

The cited art does not teach nor suggest a process assembly where the thermal interface device includes a substantially planar carbon structure located between at least a portion of first and second containing layers with a package cover coupled to the first layer as claimed in claim 12.

The cited art does not teach nor suggest an information, handling system, a non-volatile memory, a system coupled to the memory a processor chip assembly, a thermal interface device including a substantially planar carbon structure located between at least a portion of the first and second metal layers with an integrated heat spreader coupled to the first metal layer as claimed in claim 21.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pankove, Mertol, O'Connor et al, Gruber et al, Bhagwagar, Meyer et al, Schmidt, Houle et al, and Ando et al disclose thermally enhancement structures.

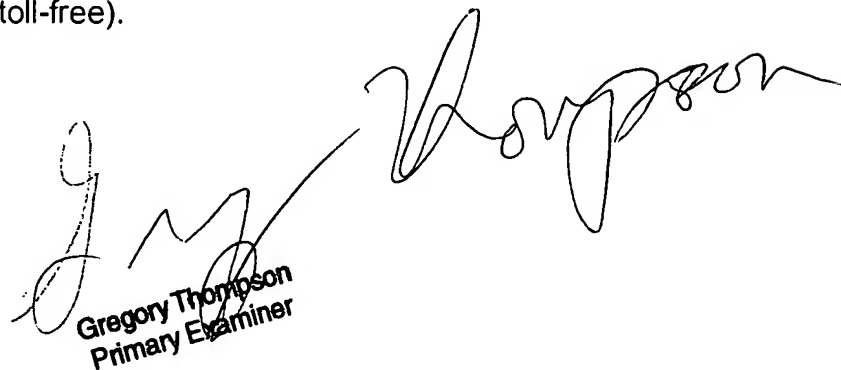
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory Thompson whose telephone number is (571)272-2045. The examiner can normally be reached on Monday-Thursday from 6:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn Feild, can be reached on (571) 272-2800, ext. 35. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thompson/ds

03/17/05



Gregory Thompson  
Primary Examiner